

Climate change impacts on suspended sediment loads in New Zealand: data dictionary

The data are supplied as geopackages (.gpkg) with suspended sediment yields and loads mapped to REC2 digital river network watersheds, projected in NZTM. Suspended sediment yield ($\text{t km}^{-2} \text{yr}^{-1}$) equates to the mean annual sediment load per unit area derived locally from each REC2 watershed, whereas sediment load corresponds to the mean annual net load (t yr^{-1}) accumulated downstream that accounts for long-term storage of sediment in lakes and reservoirs.

Yields and loads are modelled for the historical baseline (1986–2005 period, represented by 1995), and percent change under future climate modelled for mid-century (2031–2050 represented by 2040) and end-of-century (2080–2100, represented by 2090) for four CO₂ concentration scenarios (RCPs, Table 1). The results are provided as median values from outputs for six CMIP5 models (BCC-CSM1.1, CESM1-CAM5, GFDL-CM3, GISS-E2-R, HadGEM2-ES) coupled with the New Zealand regional climate model for each RCP.

Table 1. Representative concentration pathway scenarios and their descriptions

Representative concentration pathway (RCP)	Description
2.6	Mitigation scenario, requiring removal of CO ₂ from the atmosphere
4.5	CO ₂ concentrations stabilise
6.0	CO ₂ concentrations stabilise
8.5	Continual increase in CO ₂ concentrations (representing the worst-case scenario)

Sediment yield files

Sediment yields and future change are provided in `MedianYields.gpkg`, which contains the following fields:

Attribute Field	Description
nzsegment	Stream segment ID from REC2.
BaseYield	Median modelled local suspended sediment yield ($\text{t km}^{-2} \text{yr}^{-1}$) per REC2 watershed for the baseline scenario.
PercentDifferencemid26	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for mid-century under RCP 2.6 relative to the baseline.
PercentDifferencemid45	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for mid-century under RCP 4.5 relative to the baseline.
PercentDifferencemid60	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for mid-century under RCP 6.0 relative to the baseline.
PercentDifferencemid85	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for mid-century under RCP 8.5 relative to the baseline.
PercentDifferenceend26	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for end-of-century under RCP 2.6 relative to the baseline.

PercentDifferenceend45	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for end-of-century under RCP 4.5 relative to the baseline.
PercentDifferenceend60	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for end-of-century under RCP 6.0 relative to the baseline.
PercentDifferenceend85	Median percent change (%) in modelled local suspended sediment yield per REC2 watershed for end-of-century under RCP 8.5 relative to the baseline.

Sediment load files

Sediment loads and future change are provided in `MedianLoads.gpkg`, which contains the following fields:

Attribute Field	Description
nzsegment	Stream segment ID from REC2
BaseLoad	Median modelled net accumulated mean annual suspended sediment load (t yr ⁻¹).
PercentDifferencemid26	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for mid-century under RCP 2.6 relative to the baseline.
PercentDifferencemid45	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for mid-century under RCP 4.5 relative to the baseline.
PercentDifferencemid60	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for mid-century under RCP 6.0 relative to the baseline.
PercentDifferencemid85	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for mid-century under RCP 8.5 relative to the baseline.
PercentDifferenceend26	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for end-of-century under RCP 2.6 relative to the baseline.
PercentDifferenceend45	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for end-of-century under RCP 4.5 relative to the baseline.
PercentDifferenceend60	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for end-of-century under RCP 6.0 relative to the baseline.
PercentDifferenceend85	Median percent change (%) in modelled net accumulated mean annual suspended sediment load for end-of-century under RCP 8.5 relative to the baseline.